IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of transmitting data in a radio channel from a transmitter to a receiver, the method comprising:

setting a radio channel quality requirement according to ~~the~~ a user and system information;

setting a data transfer delay requirement;

determining a radio channel coherence time;

channel encoding the data;

selecting interleaving depth using the radio channel coherence time and the data transfer delay as decisive parameters;

interleaving the channel coded data;

~~if~~ when the radio channel quality requirement is not fulfilled, selecting at least one transmit diversity antenna besides the main antenna so that the radio channel quality requirement will be fulfilled;

transmitting modulated, interleaved and channel coded data with the selected antennas.

2. (Original) A method as claimed in claim 1, wherein the radio channel quality requirement is expressed as a bit error rate or a frame error rate.

3. (Original) A method as claimed in claim 1, wherein the interleaving depth is selected among predefined levels, and the antennas are selected using as parameters estimated correlation factors between the antennas.

4. (Original) A method as claimed in claim 1, wherein the radio channel coherence time is specified as the inverse of the Doppler Spread.

5. (Original) A method as claimed in claim 1, wherein the multipath diversity combining gain of the radio channel is also taken into account when the interleaving depth is being selected.

6. (Original) A method as claimed in claim 5, wherein, when the multipath diversity combining gain is being calculated the multipath components whose reception power exceeds a predefined threshold and whose distances from each other are longer than the correlation distance are taken into account.

7. (Currently Amended) A method as claimed in claim 1, wherein the antennas are used such that successive ~~symbol~~ bit are assigned to different antennas.

8. (Currently Amended) A method as claimed in claim 1, wherein the antennas are used such that the same ~~symbol~~ bit is assigned to at least two different antennas.

9. (Original) A method as claimed in claim 1, wherein transmission through each antenna contains a unique signature, such as a spreading code or a pilot symbol sequence.

10. (Original) A method as claimed in claim 1, wherein the used interleaving depth is signaled to the receiver at the beginning of the radio connection on the radio channel.

11. (Original) A method as claimed in claim 1, wherein the used interleaving depth is signaled to the receiver for each frame or packet of the radio channel.

12. (Original) A method as claimed in claim 1, wherein the interleaved and channel coded data is mapped to the antennas by a square binary matrix.

13. (Original) A method as claimed in claim 12, wherein the square binary matrix is of dimension N, in which:

- N is the number of the antennas;
- each row of the matrix corresponds to one antenna;
- each column of the matrix corresponds to one ~~symbol~~ bit to be sent;

- value 'one' in a matrix position denotes that the column ~~symbol~~ bit is sent by means of the antenna of the row; and

- value 'zero' in a matrix position denotes that the column ~~symbol~~ bit is not sent by means of the antenna of the row.

14. (Original) A method as claimed in claim 1, wherein when the radio channel coherence time is infinite, the interleaving depth is set to zero and at least one diversity antenna is used.

15. (Original) A method as claimed in claim 1, wherein the interleaving depth is set to correspond to the data transfer delay, and the number of the antennas is selected such that an effective correlation value between two successive symbols is below a predefined threshold level.

16. (Original) A method as claimed in claim 1, wherein the user and system information comprises:

- parameters related to the receiver, such as the antenna combining gain of the receiver using more than one antenna; or

- parameters related to the radio system, such as priorities among different users, priorities among different services, information regarding interference sources; or

- parameters related to the transmitter, such as hardware limitations, availability of processing resources, hardware failure.

17. (Currently Amended) A radio transmitter comprising:

a channel coder for channel encoding ~~the~~ data to be sent;

an interleaver, connected to the channel coder, for interleaving the channel coded data;

a space diversity block connected to the interleaver;

at least two transmit blocks connected to the space diversity block;

a transmit block comprising a modulation block for transmitting modulated, interleaved and channel coded data in a radio channel, and an antenna connected to the modulation block;

coherence time means for determining a radio channel coherence time;

transfer delay means for detecting a data transfer delay requirement;

interleaving selection means for selecting [[a]] an interleaving depth using the radio channel coherence time and the data transfer delay as decisive parameters, the interleaving selection means obtaining an input from the coherence time means and the transfer delay means, and interleaving selection means giving interleaving depth as an input to the interleaver;

quality means for detecting a radio channel quality requirement according to the user and system information; and

antenna diversity selection means for selecting at least one transmit diversity antenna besides the main antenna ~~if~~ when the radio channel quality requirement is not fulfilled, so that the radio channel quality requirement will be fulfilled, the antenna diversity selection means obtaining the radio channel quality requirement as an input from the quality means, and the antenna diversity selection means giving the selected transmit blocks as an input to the space diversity block.

18. (Previously Presented) A radio transmitter as claimed in claim 17, wherein the radio channel quality requirement is expressed as a bit error rate or a frame error rate in the quality means.

19. (Previously Presented) A radio transmitter as claimed in claim 17, wherein the interleaving depth is selected among predefined levels defined in the interleaving selection means, and the antennas are selected using as parameters estimated correlation factors between the antennas defined in the antenna diversity selection means.

20. (Previously Presented) A radio transmitter as claimed in claim 17, wherein the radio channel coherence time is specified as the inverse of the Doppler Spread in the coherence time means.

21. (Previously Presented) A radio transmitter as claimed in claim 17, wherein the transmitter further comprises a channel measurement block, and the measured multipath diversity combining gain of the radio channel is also taken into account when the interleaving depth is being selected in the interleaving selection means.

22. (Original) A radio transmitter as claimed in claim 21, wherein, when the multipath diversity combining gain is being calculated the multipath components whose reception power exceeds a predefined threshold and whose distances from each other are longer than the correlation distance are taken into account.

23. (Currently Amended) A radio transmitter as claimed in claim 17, wherein the antennas are used such that successive ~~symbols~~ bits are assigned to different antennas in the antenna diversity selection means.

24. (Currently Amended) A radio transmitter as claimed in claim 17, wherein the antennas are used such that the same ~~symbol~~ bit is assigned to at least two different antennas in the antenna diversity selection means.

25. (Previously Presented) A radio transmitter as claimed in claim 17, wherein the transmitter further comprises means for adding to the transmission through each antenna a unique signature, such as a spreading code or a pilot symbol sequence.

26. (Previously Presented) A radio transmitter as claimed in claim 17, wherein the transmitter further comprises means for signaling the used interleaving depth to the receiver at the beginning of the radio connection on the radio channel.

27. (Previously Presented) A radio transmitter as claimed in claim 17, wherein the transmitter further comprises means for signaling the used interleaving depth to the receiver for each frame or packet of the radio channel.

28. (Previously Presented) A radio transmitter as claimed in claim 17, wherein the interleaved and channel coded data is mapped to the antennas by a square binary matrix located in the space diversity block.

29. (Previously Presented) A radio transmitter as claimed in claim 28, wherein the square binary matrix is of dimension N, in which:

- N is the number of the antennas;
- each row of the matrix corresponds to one antenna;

- each column of the matrix corresponds to one symbol to be sent;

- value 'one' in a matrix position denotes that the column symbol is sent by means of the antenna of the row;

- value 'zero' in a matrix position denotes that the column symbol is not sent by means of the antenna of the row.

30. (Previously Presented) A radio transmitter as claimed in claim 17, wherein when the radio channel coherence time is infinite in the coherence time means, the interleaving depth is set to zero in the interleaving selection means and at least one diversity antenna is used in the antenna diversity selection means.

31. (Previously Presented) A radio transmitter as claimed in claim 17, wherein the interleaving depth is set to correspond to the data transfer delay in the interleaving selection means, and the number of the antennas is selected in the antenna diversity selection means such that an effective correlation value between two successive symbols is below a predefined threshold level.

32. (Previously Presented) A radio transmitter as claimed in claim 17, wherein the user and system information in the quality means comprises:

- parameters related to the receiver, such as the antenna combining gain of the receiver using more than one antenna; or

- parameters related to the radio system, such as priorities among different users, priorities among different services, information regarding interference sources; or

- parameters related to the transmitter, such as hardware limitations, availability of processing resources, hardware failure.

33. (Withdrawn) A radio receiver comprising:

at least one transmit antenna separation block comprising an antenna, radio frequency parts connected to the antenna, at least two Rake receivers connected to the radio frequency parts, the number of the Rake receivers corresponding to the number of the transmit antennas used for transmitting the received signal;

a transmit diversity combining block, connected to the Rake receivers, for combining the signal received from different transmit antennas;

a deinterleaver, connected to the transmit diversity combining block, for deinterleaving the received signal;

a channel decoder, connected to the deinterleaver, for decoding the channel coding of the received signal.

34. (Withdrawn) A radio receiver as claimed in claim 33, wherein between the Rake receivers and the transmit diversity combining block there is a receive diversity combining block comprising at least two combining networks for combining the signal sent using the same transmit antenna and received through different antennas.